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INDEXES

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NEW NUCLEAR DATA

Summary of New Nuclear Data on Half Lives, Radiations, Relative Isotopic Abundances, Nuclear Moments, Neutron Cross Sections, Reaction Energies, and Masses

Prepared by National Bureau of Standards Nuclear Data Group with the Assistance of Readers

National Bureau of Standards Group: K. Way, C. L. McGinnis, M. Wood, and K. Thew.

Readers: G. Friedlander and G. Scharff-Goldhaber, Brookhaven National Laboratory; P. Axel, University of Illinois; J. R. Stehn, Knolls Atomic Power Laboratory; L. Slack, Naval Research Laboratory; H. Pomerance, J. W. Cobble, F. K. McGowan, B. A. Soldano, and H. Zeldes, Oak Ridge National Laboratory; S. Frankel, University of Pennsylvania; W. E. Meyerhof, Stanford University.

In this issue, Nuclear Science Abstracts presents its second cumulation of new nuclear data. The material cumulated here is that which has appeared in NSA Vol. 6, Nos. 7 through 12A.

MAGNETIC MOMENT STANDARDS

In order to have a consistent basis for recording data on magnetic moments, results have been based on the following values and are without diamagnetic corrections.

$\mu(\text{H}^1) = 2.7934$ nuclear magnetons

This value has been adopted arbitrarily because it is the one used as a base in the Table of H. L. Poss, The Properties of Atomic Nuclei, I. Spins, Magnetic Moments and Electric Quadrupole Moments. (Revised, BNL-26 (T-10), (unclassified).) The values reported in the New Nuclear Data summaries are thus directly comparable with those listed in the survey of Poss.

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Proc. Phys. Soc., (London) **A64**, Nos. 379-384; **A65**, 385-388.
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Phys. Rev. **83**, Nos. 1-6; **84**, 1-6; **85**, 1-5.
Z. Naturforsch. **6a**, Nos. 7-12.
Z. Physik **129**, Nos. 1-6; **130**, 1-5; **131**, 1-4.

ABBREVIATIONS

α absorption measurement
 $\alpha\beta\gamma$ absorption of β 's in coincidence with γ 's
 αce^- absorption of conversion electrons

a coin measurement by placing absorbers between counters in coincidence
 α total γ -ray conversion coefficient, N_e/N_γ

NEW NUCLEAR DATA

$\alpha_K, \alpha_L, \dots$	γ -ray conversion coefficient for electrons ejected from the K, L, ... shell	μ	(1) magnetic moment in units of nuclear magnetons, (2) micron, 10^{-4} cm
b	coefficient in angular correlation function, $1 + b \cos^2 \theta$	μs	microseconds
B	band spectra method	osc	pile oscillator method
Beyn	measurement by detection of photoneutrons from Be	para	paramagnetic resonance method
cc	cloud chamber	pc	proportional counter
ce ⁻	conversion electrons	pe ⁻	photo electrons
chem	chemical separation of product following reaction	ppl	photoplates or emulsions
Cpt	Compton electrons	q	electric quadrupole moment in units of barns
d	(1) deuteron, (2) descendant of, (3) days, when used as superscript	Q	reaction energy in Mev
Dyn, Dyp	measurement by detection of photoneutrons or photoprotons from deuterium	s	(1) spectrometer method, (2) seconds, when used as superscript
EA	electrostatic analyzer	S	atomic-spectra measurement
E ₀	resonance energy	scin	scintillation counter
E _{β} , E _{γ} , ...	energy of β ray, energy of γ ray, ...	sl	lens spectrometer
E1, E2, ...	electric dipole, electric quadrupole ...	sl; ce ⁻	conversion electrons measured in lens spectrometer
f	fission, in abbreviations for methods of production or detection	st	strong
F-K	Fermi-Kurie β energy distribution plot	$s\pi$	180° spectrometer
Γ	resonance half-width (the whole width at half-maximum)	$s\pi \sqrt{2}$	double focusing spectrometer
I	(1) spin in units of $\hbar/2\pi$; (2) nuclear induction magnetic resonance method	σ	cross section in barns
ic	ionization chamber	σ_0	cross section at resonance energy, E ₀
K/L	α_K/α_L	σ_a	absorption cross section
M	molecular or atomic beam resonance method	σ_{el}	elastic scattering cross section
M1, M2, ...	magnetic dipole, magnetic quadrupole ...	σ_{in}	inelastic scattering cross section
mb	millibarns	σ_s	scattering cross section
Mic	microwave method	σ_t	total cross section
mir	measurement by total reflection of neutron beam from mirror surface	t	triton, H ³
ms	mass spectrometer	th	thermal
		w, vw	weak, very weak
		τ	half life in units indicated
		$\beta\gamma, \gamma\gamma$	$\beta\gamma$ or $\gamma\gamma$ coincidences
		$\beta\gamma(\theta)$	angular correlation of β 's and γ 's in coincidence
		d, p(θ)	angular distribution of protons with respect to deuteron beam

Standard journal abbreviations are used.

All energies are given in Mev and all cross sections in barns unless otherwise stated in the tabular material.

NEW NUCLEAR DATA

${}^0n^4$	Not found from Rh or Bi (18 Mev n)		K.-H. Sun et al., <u>Phys. Rev.</u> 85 , 942 (1952).	${}^3Li^7$	Level	Be ⁹ (d, α)	A. Ashmore, J. F. Raffle, <u>Proc. Phys. Soc. (London)</u> A65 , 296(1952).
H	σ_t (10.0 ev) (lucite) 20.09 (polystyrene) 20.49		C. T. Hibdon, <u>ANL-4602</u> (March 1951).		4.59		
	σ_t (14.1 Mev) 0.689		H. L. Poss et al., <u>Phys. Rev.</u> 85 , 703A(1952).			Li ⁶ (d, p γ)Li ⁷	W. H. Burke, J. R. Risser, <u>Phys. Rev.</u> 85 , 741A(1952).
${}^1H^3$	Spectral shape analyzed neutrino mass <5 kev		O. Kofoed-Hansen, <u>Phil. Mag.</u> 42 , 1448 (1951).			Li ⁶ (d, p γ)Li ⁷	G. C. Phillips et al., <u>Phys. Rev.</u> 85 , 742A(1952).
He	σ_s (th n) 0.78		C. T. Hibdon, C. O. Muehlhause, <u>ANL-4680</u> (Sept. 1951).			$\sigma[B^{10}(n, \alpha)Li^7]$ $\sigma[B^{10}(n, \alpha)0.477 \text{ level } Li^7]$ graph for E _n = 0 - 4	H. Bichsel et al., <u>Helv. Phys. Acta</u> 25 , 119(1952).
${}^3Li^6$	Level	Li ⁶ (p, p)	W. M. Harris, <u>Phys. Rev.</u> 84 , 1249(1951).	Be	σ_t (1.9 - 3.8 Mev)	graph	R. Ricamo, W. Zünti, <u>Helv. Phys. Acta</u> 24 , 419(1951).
	2.12	$s\pi$			Broad maximum at 2.75		
${}^3Li^7$	μ	I	T. Kanda et al., <u>Phys. Rev.</u> 85 , 938(1952).				

${}^7\text{Be}_3$	$\text{Li}^6(\text{p}, \text{p})$ and p, α)		S. Bashkin, H. T. Richards, <u>Phys. Rev.</u> 84 , 1124(1951).	${}^5\text{B}_5^{10}$	Level	$\text{B}^{10}(\text{p}, \text{p})$	N. P. Heydenburg et al., <u>Phys. Rev.</u> 85 , 742A(1952).		
	Levels	Γ J			2.34	a			
	~ 6.4	large $\leq \frac{1}{2}+$							
	7.16	0.43 $\frac{1}{2}-$							
	Level	$\text{B}^{10}(\text{p}, \alpha\gamma)$	R. B. Day, T. Huus, <u>Phys. Rev.</u> 85 , 761A(1952).	${}^5\text{B}_6^{11}$	γ 's	$\text{B}^{10}(\text{d}, \text{p})$	J. Terrell, G. C. Phillips, <u>Phys. Rev.</u> 83 , 703(1951).		
		0.432 scin			4.5, 6.7, 9.0	pair s			
	No other γ with $E_\gamma < 1.0$								
	No $\gamma\gamma$	scin	F. R. Metzger, <u>Phys. Rev.</u> 85 , 727A(1952).	C	$p_\gamma(\theta) = \text{constant}$	$\text{B}^{10}(\text{d}, n\gamma)\text{B}^{11}$ $E_d = 1.8$	G. C. Phillips et al., <u>Phys. Rev.</u> 85 , 742A(1952).		
	Levels	$\text{Li}^6(\text{d}, \text{n})\text{Be}^7$			Level	$\text{B}^{11}(\text{p}, \text{p})$			
	22.58, 23.68	pc			2.06	a			
${}^4\text{Be}_4^1$		$\text{Li}^7(\text{p}, \gamma)$	H. Nabholz et al., <u>Helv. Phys. Acta</u> 25 , 153(1952).	${}^6\text{C}_5^{11}$	$\sigma_t(1.9 - 3.8 \text{ Mev})$	graph	R. Ricamo, W. Zünti, <u>Helv. Phys. Acta</u> 24 , 419(1951).		
	Resonant γ 's isotropic, non-resonant anisotropic				E_0 σ_0 Γ				
					2.09 2.4 ~ 0.04				
		$\text{Li}^7(\text{p}, \text{p})$	S. Bashkin, H. T. Richards, <u>Phys. Rev.</u> 84 , 1124(1951).	${}^6\text{C}_6^{12}$	$\sigma_t(14.1 \text{ Mev})$		H. L. Poss et al., <u>Phys. Rev.</u> 85 , 703A(1952).		
	Resonances: 1.05, 1.88, 2.06				1.279				
	Resonance	$\text{Li}^7(\text{p}, \text{n})\text{Be}^7$			Resonance	$\text{B}^{10}(\text{p}, \alpha\gamma)$		R. B. Day, T. Huus, <u>Phys. Rev.</u> 85 , 761A(1952).	
Level	E_0 Γ								
~ 21.5	~ 4.9 ~ 0.4								
		$\text{Li}(\text{p}, \text{n})54^{\text{d}}\text{Be}$	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).	${}^6\text{C}_7^{13}$	Level	$\text{Be}(\alpha, \text{n})$	S. A. E. Johansson, <u>Phil. Mag.</u> 43 , 249(1952).		
	Resonances: 2.2, 4.5				γ	scin			
	Level	$\text{B}^{10}(\gamma, \text{d})\text{Be}^8 \rightarrow 2\alpha$			M. J. Brinkworth, E. W. Titterton, <u>Phil. Mag.</u> 42 , 952(1951).	Resonances		$\text{B}(\text{p}, \gamma)$	T. Huus, R. B. Day, <u>Phys. Rev.</u> 85 , 761A(1952).
(broad)	$\sim 5.8?$ ppl	E_0 Γ E_γ							
		0.162 4.45, 11.6							
${}^4\text{Be}_5^2$		$\text{Li}^6(\text{t}, \text{p})\text{Li}^8$	C. D. Moak et al., <u>Phys. Rev.</u> 85 , 928(1952).		0.67 0.31 4.44, 12.0, 16.4		J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).		
	Li^8 identified	$E_t = 0.35$			1.37 1.15 4.45, 12.7, 16.9	scin			
	Levels	$\left\{ \begin{array}{l} \text{Li}^7(\text{d}, \text{n})\text{Be}^8 \\ \text{Li}^7(\text{d}, \text{p})\text{Li}^8 \end{array} \right\}$			L. M. Baggett, S. J. Bame, Jr., <u>Phys. Rev.</u> 85 , 741A(1952).			$\text{B}^{11}(\text{p}, \text{n})20.4^{\text{m}}\text{C}$	J. Terrell, G. C. Phillips, <u>Phys. Rev.</u> 83 , 703(1951).
	17.22, 17.45, 17.80, 18.3	Resonances: 3.7, 5.2, 5.9, 6.4							
${}^4\text{Be}_6^3$	Level	$\text{Be}^9(\text{p}, \text{p})$	N. P. Heydenburg et al., <u>Phys. Rev.</u> 85 , 742A(1952).	${}^6\text{C}_8^{14}$		γ	$\text{B}^{11}(\text{d}, \text{n})$	R. Chastel, <u>Compt. rend.</u> 233 , 1440(1951).	
		2.57				a	4.5		
	$p(\theta)$	$\text{Be}^9(\text{d}, \text{p})$			Be^8 intermediate?				
${}^4\text{Be}_7^4$	I(0.0 and 3.37 levels) = 0, 1, 2, or 3 (+)		F. A. El-Bedewi, <u>Proc. Phys. Soc. (London)</u> A65 , 64(1952).		Level	$\text{C}^{12}(\text{p}, \text{p})$	N. P. Heydenburg et al., <u>Phys. Rev.</u> 85 , 742A(1952).		
	τ	$> 3 \times 10^{-19\text{s}}$			4.20	a			
	n spread	$\text{Be}^9(\text{p}, \text{n})$			$\alpha(\theta)$	$\text{N}^{14}(\text{d}, \alpha)$			
${}^5\text{B}_4^9$	No levels for $E_p = 2 - 5.3$	$\text{Be}(\text{p}, \text{n})$	T. M. Hahn et al., <u>Phys. Rev.</u> 85 , 934(1952).	${}^6\text{C}_7^{13}$	for 0 and 4.4 levels		W. M. Gibson, E. E. Thomas, <u>Proc. Roy. Soc. (London)</u> 210A , 543(1952).		
	Resonances	$\left\{ \begin{array}{l} \text{Be}^9(\text{p}, \text{n})\text{B}^9 \\ \text{Be}^9(\text{p}, \gamma)\text{B}^{10} \end{array} \right\}$			n(θ)	$\text{C}^{12}(\text{n}, \text{n})$		R. Ricamo, <u>Nuovo cimento</u> 8 , 893(1951).	
	E_0 Γ				Level	J			
	2.57 4.72	~ 0.5		8.20 $d_{3/2}$					
${}^5\text{B}_5^{10}$	Level	$\text{B}(\text{p}, \text{p}\gamma)$	R. B. Day, T. Huus, <u>Phys. Rev.</u> 85 , 761A(1952).		σ_s coh	4.5 (+)	W. C. Koehler, E. O. Wollan, <u>Phys. Rev.</u> 85 , 491(1952).		
	0.718	scin			σ_s bound	5.5			

${}^6\text{C}_{16}$	γ	~ 5.5	a coin	E. L. Hudspeth, W. B. Rose, <i>Phys. Rev.</i> 85 , 742A(1952). $\text{C}^{14}(1.8 \text{ Mev d,p})$.	${}^8\text{O}_{17}$	$\text{O}^{16}(\text{d,p})\text{O}^{17}$ $p\gamma(\theta) = \text{constant}$ $E_d = 1.7, 2.0$	G. C. Phillips et al., <i>Phys. Rev.</i> 85 , 742A(1952).
${}^7\text{N}_{14}$	Resonance	$\text{C}^{12}(\text{d,n})\text{N}^{13}$		K. Famularo et al., <i>Phys. Rev.</i> 85 , 742A(1952).	${}^9\text{F}_{10}$	$\text{O}^{18}(\text{p,n})1.87^h\text{F}$ Resonances: 3.3, 3.8, 4.25, 5.1, 5.6, 6.2, 6.7	J. P. Blaser et al., <i>Helv. Phys. Acta</i> 24 , 465(1951).
	E_0	$\Gamma(\text{kev})$		J. D. Seagrave, <i>Phys. Rev.</i> 85 , 197(1952).		Levels	$\text{F}(\text{p,p})$
	1.435	~ 6				1.53, 3.83	a
	Levels	$\Gamma(\text{kev})$					
	8.05	32.5					
	8.62	6					
	8.70	500					
	9.18	2.1					
	9.49	45					
	$\text{C}^{13}(\text{p,n})10.1^m\text{N}$			J. P. Blaser et al., <i>Helv. Phys. Acta</i> 24 , 465(1951).	Ne	Levels	$\text{Ne}(\text{p,p})$
	Resonances: 4.0, 5.0, 6.2					1.44, 4.36	a
	Levels	$\text{N}(\text{p,p})$		N. P. Heydenburg et al., <i>Phys. Rev.</i> 85 , 742A(1952).	${}_{10}\text{Ne}_{19}$	τ	18.6^s
	2.35, 3.95	a					
	$d(\theta)$	$\text{N}(\text{d,d})$		W. M. Gibson, E. E. Thomas, <i>Proc. Roy. Soc. (London)</i> 210A , 543(1952).	${}_{10}\text{Ne}_{20}$	Resonances	$\left\{ \begin{array}{l} \text{F}^{19}(\text{p},\alpha\gamma)\text{O}^{16} \\ \text{F}^{19}(\text{p,n})\text{Ne}^{19} \end{array} \right.$
	$\sigma(2 \text{ Mev n,p}) = 0.07$			W. Bollmann, W. Zünti, <i>Helv. Phys. Acta</i> 24 , 517(1951).		$E_p = 0.2 - 5.4$	
	$(3.6 \text{ Mev n,p}) = 0.15$					$\text{F}^{19}(\text{p,n})18^s\text{Ne}$	
	$\sigma(2 \text{ Mev n},\alpha) = 0.01$					Resonances: 4.8, 5.4, 5.8, 6.1, 6.5	
	$(3.6 \text{ Mev n},\alpha) = 0.02$					No n thresholds for $E_d = 0.5 - 2$	$\text{F}^{19}(\text{d,n})$
${}^7\text{N}_{15}$	Resonances	$\text{N}^{14}(\text{n},\alpha)\text{B}^{11}$		W. Bollmann, W. Zünti, <i>Helv. Phys. Acta</i> 24 , 517(1951).		γ 's	$\text{F}^{19}(\text{d,n})$
	2.26, 2.56, 2.75					8.1, 9.3, 11.5	pair s
	2.26, 2.80	$\text{N}^{14}(\text{n,p})\text{C}^{14}$			Na	$\sigma_t(2 - 80 \text{ kev})$	
	$p(\theta)$ ppl	$\text{N}(\text{d,p})$		W. M. Gibson, E. E. Thomas, <i>Proc. Roy. Soc. (London)</i> 210A , 543(1952). $E_d = 7.89$.		graph	
	Level	I				E_0	2.8, 5.5 kev
	ground	$\frac{1}{2}-, \frac{3}{2}-, \frac{5}{2}-$			${}_{11}\text{Na}_{12}$	μ	2.2167
	6.33	$\frac{3}{2}-, \frac{5}{2}- ?$					I
	8.32	$\frac{1}{2}+, \frac{3}{2}+$				Level	$\text{Na}(\text{d,p})$
	9.22	$\frac{1}{2}+, \frac{3}{2}+$				3.67	a
	γ 's	$\text{N}^{14}(\text{d,p})$		J. Terrell, G. C. Phillips, <i>Phys. Rev.</i> 83 , 703(1951).			
	4.4, 5.3, 6.4, 7.4, 8.5	pair s			${}_{12}\text{Mg}_{12}$	$\text{Na}^{23}(\text{p,n})11.9^m\text{Mg}$	
O	$\sigma_t(1.9 - 3.8 \text{ Mev})$	graph		R. Ricamo, W. Zünti, <i>Helv. Phys. Acta</i> 24 , 419(1951).		Resonances: 5.3, 5.6, 6.0, 6.2, 6.4	J. P. Blaser et al., <i>Helv. Phys. Acta</i> 24 , 465(1951).
	E_0	1.9, 3.75				$(1.4\gamma)p(\theta)$	$\text{Mg}^{24}(\text{p,p}\gamma)$
	Marked dip at 2.37						
${}^8\text{O}_{16}$	Capture γ 's	$\text{N}(\text{p},\gamma)$		C. H. Johnson et al., <i>Phys. Rev.</i> 85 , 931(1952); 85 , 727A(1952).		$\sigma_a(\text{th n})$	
	0.75 5.29					0.033	osc
	1.39 6.21						
	2.38 6.84	scin			${}_{12}\text{Mg}_{13}$	New levels	$\text{Al}^{27}(\text{d},\alpha)$
${}^8\text{O}_{17}$	$\sigma_s(\theta)$	$\text{O}^{16}(\text{n,n})$		E. Baldinger et al., <i>Phys. Rev.</i> 84 , 1058(1951); <i>Helv. Phys. Acta</i> 25 , 142(1952).		3.96, 4.12, 6.98, 7.85, 8.62, 9.06, 9.75, 10.78, 11.89	ppl
	Level	I					
	5.94	$p_{1/2}$					
	6.36	$s_{1/2}$					
	7.28	$d_{3/2}$					
	7.73	$p_{3/2}$					
	8.29	$p_{1/2}$					
	$p(\theta)$ ppl	$\text{O}(\text{d,p})$		E. J. Burge et al., <i>Proc. Roy. Soc. (London)</i> 210A , 534(1952). $E_d = 7.73$.			
	Level	I					
	ground	$\frac{5}{2}+, \frac{3}{2}+$					
	0.88	$\frac{1}{2}+$					

$^{12}\text{Mg}_{13}^{25}$	$\sigma_a(\text{th n})$ 0.27 osc	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{15}\text{P}_{16}^{31}$	$\sigma_s(\text{th n})$ 4.67	C. T. Hibdon, C. O. Muehlhause, <u>ANL-4680</u> (Sept. 1951).
$^{12}\text{Mg}_{14}^{26}$	$\sigma_a(\text{th n})$ 0.06 osc	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{15}\text{P}_{17}^{32}$	β^- 1.697 sl	H. T. Motz, <u>Phys. Rev.</u> 85 , 501(1952).
$^{13}\text{Al}_{11}^{24}$	τ 2.3 ^s Delayed α emitter $E_p = 15.4$	Mg(p,n) A. C. Birge, <u>Phys. Rev.</u> 85 , 753A(1952).		β^- 1.704 Bump at $H\rho \sim 1000$ not found by S(d) or P(n)	sl E. N. Jensen et al., <u>Phys. Rev.</u> 85 , 112 (1952).
$^{13}\text{Al}_{13}^{26}$	τ 6.5 ^s	L. Katz, A. G. W. Cameron, <u>Phys. Rev.</u> 84 , 1115(1951).	$^{15}\text{P}_{18}^{33}$	τ 24.8 ^d β^- 0.26 sl	E. N. Jensen et al., <u>Phys. Rev.</u> 85 , 112 (1952). S(n,p); S(γ ,p).
$^{13}\text{Al}_{13}^{267}$	Mg(p,n)7.3 ^s Al Resonances: 5.5, 5.8, 6.0, 6.3, 6.5	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).	S	Variation in terrestrial $\text{S}^{32}/\text{S}^{34}$ ratio Same ratio for igneous and meteoritic samples	J. Macnamara et al., <u>Can. J. Chem.</u> 30 , 73(1952).
$^{13}\text{Al}_{14}^{27}$	μ 3.6395 I Levels 1.02, 2.30, 2.89, 3.32, 4.48 Al(p,p) a Levels 22 tentative values Al(p,p)	T. Kanda et al., <u>Phys. Rev.</u> 85 , 938(1952). N. P. Heydenburg et al., <u>Phys. Rev.</u> 85 , 742A (1952). E. M. Reilley et al., <u>Phys. Rev.</u> 85 , 704A(1952).	$^{17}\text{Cl}_{18}^{35}$	μ 0.82110 I q coupling ratio $\text{TICl}^{35}/\text{TICl}^{37}$ 1.2691 \pm 0.0004 M 1.270 \pm 0.005 M	H. E. Walchli et al., <u>Phys. Rev.</u> 85 , 922 (1952). R. O. Carlson et al., <u>Phys. Rev.</u> 85 , 784 (1952). H. J. Zeiger, D. I. Bolef, <u>Phys. Rev.</u> 85 , 788(1952).
$^{14}\text{Si}_{14}^{28}$	Al ²⁷ (p,n)4.9 ^s Si Resonances: 6.2, 6.4 $\sigma_a(\text{th n})$ 0.08 osc	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951). H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{17}\text{Cl}_{19}^{36}$	I q 2 -0.0164 Mic Mic	D. A. Gilbert, <u>Phys. Rev.</u> 85 , 716A(1952). G. Boato, <u>Nuovo cimento</u> 9 , 44(1952).
$^{14}\text{Si}_{15}^{29}$	$\sigma_a(\text{th n})$ 0.27 osc	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{18}\text{A}_{18}^{36}$	$\text{A}^{40}/\text{A}^{36}$ { inner earth } atmospheric } >1	W. A. Schoenfeld et al., <u>Phys. Rev.</u> 85 , 873(1952).
$^{14}\text{Si}_{16}^{30}$	$\gamma^1\text{s}$ γ_1 2.32 γ_2 3.6 γ_3 1.28 γ_4 ~2.7 Coincidences $\text{P}_1\gamma_1, \text{P}_2\gamma_2, \text{P}_3\gamma_2, \text{P}_3\gamma_3, \text{P}_3\gamma_4$ $\sigma_a(\text{th n})$ 0.41 osc	Al ²⁷ (α ,p) R. C. Allen et al., <u>Phys. Rev.</u> 84 , 1203 (1951). H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{18}\text{A}_{20}^{38}$	Resonances Cl ³⁷ (p,n) A^{37} over 100 found for $E_p = 1.64 - 2.51$ Cl(p,n)34 ^d A Excitation function	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951). L. G. Elliott, <u>Phys. Rev.</u> 85 , 942(1952).
$^{16}\text{Si}_{17}^{31}$	τ 2.65 \pm 0.01 ^h β^- 1.471 sl	H. T. Motz, <u>Phys. Rev.</u> 85 , 501(1952). P^{31} (pile n,p); chem.	$^{19}\text{A}_{23}^{41}$	$\beta\gamma$ delay 6.7 $\times 10^{-9}$ s scin p(θ) ppl Level ground 1.34 I $\frac{5}{2}-, \frac{1}{2}-$ $\frac{1}{2}+$? A(d,p) W. M. Gibson, E. E. Thomas, <u>Proc. Roy. Soc. (London)</u> 210A , 543(1952). $E_d = 7.81$.	J. T. Eisinger, B. Bederson, <u>Phys. Rev.</u> 85 , 716A(1952).
$^{16}\text{P}_{15}^{30}$	Levels 0.75, 1.46, 2.00 Si ²⁸ (d,n) ppl	C. E. Mandeville et al., <u>Phys. Rev.</u> 85 , 193(1952); 85 , 725A (1952).	$^{19}\text{K}_{21}^{40}$	$g_1(\text{K}^{40})/g_1(\text{K}^{39})$ -1.2434 \pm 0.0003 M $\sigma_a(\text{th n})$ 75 osc	H. Pomerance, priv. comm. (1952).
$^{16}\text{P}_{16}^{31}$	μ 1.1308 I Levels 0.33, 1.19, 2.22, 3.41 Si ³⁰ (d,n) ppl	T. Kanda et al., <u>Phys. Rev.</u> 85 , 938(1952). C. E. Mandeville et al., <u>Phys. Rev.</u> 85 , 193(1952); 85 , 725A (1952).	$^{20}\text{Ca}_{20}^{40}$	$\sigma_a(\text{th n})$ ≤ 0.22 osc Ca ⁴³ contribution unknown	H. Pomerance, priv. comm. (1952).
			$^{20}\text{Ca}_{21}^{41}$	τ 1.2 $\times 10^{5\gamma}$ * K x ray pc	F. Brown et al., <u>Phys. Rev.</u> 84 , 1243(1951). *Based on $\sigma[\text{Ca}^{40}(\text{n},\gamma)\text{Ca}^{41}] = 0.35$ and K fluorescence yield = 0.1.
			$^{20}\text{Ca}_{22}^{42}$	$\sigma_a(\text{th n})$ 40 osc	H. Pomerance, priv. comm. (1952).

$^{20}\text{Ca}^{46}_{28}$	τ	$>2 \times 10^{16}\text{y}$	J. W. Jones, T. P. Kohman, <u>Phys. Rev.</u> 85 , 941(1952).	$^{26}\text{Fe}^{56}_{30}$	$\sigma_a(\text{th n})$	2.55	osc	H. Pomerance, priv. comm. (1952).
Ti	$\sigma_s(\text{th n})$	3.96	C. T. Hibdon, C. O. Muehlhause, <u>ANL-4680</u> (Sept. 1951).	$^{26}\text{Fe}^{57}_{31}$	$\sigma_a(\text{th n})$	2.36	osc	H. Pomerance, priv. comm. (1952).
	$\sigma_t(3000 \text{ ev})$	5.02	C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).	$^{26}\text{Fe}^{58}_{32}$	$\sigma_a(\text{th n})$	2.5	osc	H. Pomerance, priv. comm. (1952).
	$\sigma_t(2 - 40 \text{ kev})$		C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).	$^{26}\text{Fe}^{59}_{33}$	γ 2.5% (0.195 γ) (1.0 γ)	0.195	scin	F. R. Metzger, <u>Phys. Rev.</u> 85 , 727A(1952).
$^{22}\text{Ti}^{46}_{24}$	$\sigma_a(\text{th n})$	0.57	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	Co	$\sigma_s(\text{th n})$	8.34		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).
	E_0	19, 23 kev			$\sigma_t(10.0 \text{ ev})$	10.29		
$^{22}\text{Ti}^{47}_{25}$	$\sigma_a(\text{th n})$	1.62	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).		(19.5 ev)	8.52		
	E_0	5.5, 8?, 29.5 kev			(2700 ev)	4.09		
$^{22}\text{Ti}^{48}_{26}$	$\sigma_a(\text{th n})$	7.98	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).		(3000 ev)	4.55		
$^{22}\text{Ti}^{49}_{27}$	$\sigma_a(\text{th n})$	1.80	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).	$^{27}\text{Co}^{60}_{29}$	$\sigma_t(2 - 100 \text{ kev})$			C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).
$^{22}\text{Ti}^{49}_{27}$	I	$\frac{1}{2}?$	C. D. Jeffries et al., <u>Phys. Rev.</u> 85 , 478 (1952).	$^{27}\text{Co}^{60}_{29}$	μ	3.0	$\gamma(\theta, T)$	B. Bleaney et al., <u>Phys. Rev.</u> 85 , 688 (1952).
$^{22}\text{Ti}^{50}_{28}$	$\sigma_a(\text{th n})$	0 ± 0.2	H. Pomerance, T. Arnette, <u>ORNL-940</u> (1950).			3.2	$\gamma(\theta, T)$	C. J. Gorber et al., <u>Physica</u> 18 , 135 (1952).
V	$\sigma_t(2 - 25 \text{ kev})$		C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).		$\gamma\gamma(\theta)$	1.1 γ , 1.3 γ	\geq octupole	S. Das, S. K. Sen, <u>Indian J. Phys.</u> 25 , 451(1951).
$^{23}\text{V}^{50}_{27}$	g_I	+0.55704	H. E. Walchli et al., <u>Phys. Rev.</u> 85 , 922 (1952).	Ni	$\sigma_t(2 - 41 \text{ kev})$			C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).
$^{24}\text{Cr}^{53}_{24}$	I	$\frac{3}{2}$	B. Bleaney, K. D. Bowers, <u>Proc. Phys. Soc. (London)</u> A64 , 1135(1951).		E_0	4.5, 17, 30? kev		
Mn	$\sigma_t(2 - 80 \text{ kev})$		C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).		Level	1.44	Ni(p,p)	N. P. Heydenburg et al., <u>Phys. Rev.</u> 85 , 742A (1952).
$^{25}\text{Mn}^{53}_{25}$	Level	0.40	P. H. Stelson, W. M. Preston, <u>Phys. Rev.</u> 83 , 469(1951).		13 levels		Ni(p,p)	R. Ely, Jr., et al., <u>Phys. Rev.</u> 85 , 704A(1952).
Fe	$\sigma_t(77 - 800^\circ\text{K})$		R. Latham, J. M. Cassels, <u>Proc. Phys. Soc. (London)</u> A65 , 241(1952).	$^{28}\text{Ni}^{60}_{32}$	Levels	1.338, 1.475, 2.497	Ni(p,p)	R. Ely, Jr., et al., <u>Phys. Rev.</u> 85 , 704A(1952).
	$E_n \sim 0.002 \text{ ev}$		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).	$^{30}\text{Zn}^{67}_{37}$	I	$\frac{5}{2}$	I	S. S. Dharmatti, H. E. Weaver, Jr., <u>Phys. Rev.</u> 85 , 927(1952).
	$\sigma_t(3000 \text{ ev})$	7.00	C. T. Hibdon et al., <u>Phys. Rev.</u> 85 , 595 (1952).	Ge	μ	+0.87376 ± 0.00013		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).
$^{26}\text{Fe}^{54}_{26}$	$\sigma_a(\text{th n})$	2.18	H. Pomerance, priv. comm. (1952).		$\sigma_t(10.0 \text{ ev})$	5.13		
					(19.5 ev)	4.08		
					(120 ev)	4.93		
					(345 + 2400 ev)	4.01		
					(2700 ev)	2.54		
					(3800 ev)	4.47		
				$^{32}\text{Ge}^{70}_{38}$	$\sigma_a(\text{th n})$	3.3	osc	H. Pomerance, <u>ORNL-577</u> (1949); <u>Phys. Rev.</u> 78 , 814(1950).
				$^{32}\text{Ge}^{72}_{40}$	$\sigma_a(\text{th n})$	0.94	osc	H. Pomerance, <u>ORNL-577</u> (1949); <u>Phys. Rev.</u> 78 , 814(1950).
				$^{32}\text{Ge}^{73}_{41}$	$\sigma_a(\text{th n})$	13.7	osc	H. Pomerance, <u>ORNL-577</u> (1949); <u>Phys. Rev.</u> 78 , 814(1950).

³² Ge ₄₂ ⁷⁴	σ _a (th n)	0.60	osc	H. Pomerance, ORNL-577(1949); Phys. Rev. <u>78</u> , 814(1950).	³⁷ Rb ₄₉ ⁸⁶	βγ(θ)	b = +0.13	D. T. Stevenson, M. Deutsch, Phys. Rev. <u>83</u> , 1202(1951).
³² Ge ₄₄ ⁷⁶	σ _a (th n)	0.35	osc	H. Pomerance, ORNL-577(1949); Phys. Rev. <u>78</u> , 814(1950).	³⁸ Sr ₄₇ ⁸⁵ 70 ^m	K 14% γ 84.7%	0.0075 α = large E3 0.150 0.225 MI α ~ 0.026, K/L ~ 5 1.3% 0.233 M4 (0.150γ)X No (0.233γ)X	A. W. Sunyar et al., Phys. Rev. <u>85</u> , 734A(1952); priv. comm. Sr ⁸⁴ (pile n).
³² Ge ₄₅ ⁷⁷ 59 ^s	γ	0.380	scin	A. C. G. Mitchell, A. B. Smith, Phys. Rev. <u>85</u> , 153(1952). Ge(slow n).	³⁸ Sr ₄₇ ⁸⁵ 65 ^d	γ 0.514 s; ce ⁻ , pe ⁻ α _K = 0.007, K/L ~ 12 τ > 1 ^{μs} No e ⁻ with 0.12 < E < 0.2 X/γ ~ 1	W. S. Emmerich, J. D. Kurbatov, Phys. Rev. <u>85</u> , 149 (1952); <u>85</u> , 733A (1952).	
12 ^h	β ⁻	2.2 complex	s	A. C. G. Mitchell,	K			A. W. Sunyar et al., Phys. Rev. <u>85</u> , 734A(1952); priv. comm. Rb(d); chem.
	γ	0.263	s	A. B. Smith, Phys. Rev. <u>85</u> , 153(1952).	Zr	α _K (19.5 ev) 6.23 (120 ev) 6.30 (345 + 2400 ev) 5.83 (2700 ev) 6.03 (3000 ev) 6.23	C. T. Hibdon, ANL- 4602 (Mar. 1951).	
As	σ _i (2700 ev)	7.35		C. T. Hibdon, ANL- 4602 (Mar. 1951).	⁴¹ Nb ₅₀ ⁹¹ 64 ^d	τ 62 ^d γ 0.105 K/L + M = 2.1	P. Preiswerk, P. Stähelin, <u>Helv.</u> Phys. Acta <u>24</u> , 300 (1951).	
³³ As ₃₈ ⁷¹	τ	~50 ^h		D. F. Bracher, A. R. Crathorn, Nature <u>169</u> , 364(1952). Ge(d,n); ms.	⁴¹ Nb ₅₁ ⁹²	K > 99.95% β ≤ 0.05% γ > 99.95% 0.930	P. Preiswerk, P. Stähelin, <u>Helv.</u> Phys. Acta <u>24</u> , 300 (1951).	
³³ As ₄₂ ⁷⁵	I	½	I	C. D. Jeffries et al., Phys. Rev. <u>85</u> , 478(1952).	⁴¹ Nb ₅₃ ⁹⁴	τ ₂ > 5 × 10 ^{4y}	R. E. Hein et al., Phys. Rev. <u>85</u> , 138 (1952).	
	μ	+1.4354	I		⁴¹ Nb ₅₄ ⁹⁵ 90 ^h	τ 80 ^h γ 0.232 sl; pe ⁻ K/L + M = 3.5	P. Preiswerk, P. Stähelin, <u>Helv.</u> Phys. Acta <u>24</u> , 300 (1951).	
³³ As ₄₃ ⁷⁶	γ	1.0* 0.555 0.095* 0.648 0.25* 1.21 0.016* 1.41 0.055* 2.06	sl; pe ⁻ , Cpt	P. Hubert, J. phys. radium <u>12</u> , 823 (1951). *Relative intensity.	⁴¹ Nb ₅₅ ⁹⁶	τ 23 ^h β ⁻ 8% 0.370 sl 92% 0.750 γ α × 10 ⁴ 7 0.216 < 230 10 0.238 < 160 27 0.451 40 61 0.560 16 5 0.725? ? 100 0.770 12 6 0.804 13 16 0.840 12 52 1.078 5.6 32 1.187 3.1	P. Preiswerk, P. Stähelin, <u>Helv.</u> Phys. Acta <u>24</u> , 300 (1951).	
³³ As ₄₅ ⁷⁹	β ⁻	~2.1	a	P. J. Van der Haack et al., <u>Physica</u> <u>18</u> , 20(1952). Se(n), Se(d); chem.				
	No γ							
³⁴ Se ₄₀ ⁷⁴	σ _a (th n)	44	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).				
³⁴ Se ₄₂ ⁷⁶	σ _a (th n)	82	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).				
³⁴ Se ₄₃ ⁷⁷	I	½	B	S. P. Davis, F.A. Jenkins, Phys. Rev. <u>83</u> , 1269(1951).				
	σ _a (th n)	40	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).				
³⁴ Se ₄₄ ⁷⁸	I	0	B	S. P. Davis, F. A. Jenkins, Phys. Rev. <u>83</u> , 1269(1951).				
³⁴ Se ₄₅ ⁷⁹ 6.5 × 10 ^{4y}	I	½	Mic	W. A. Hardy et al., Phys. Rev. <u>85</u> , 494(1952). Fission; chem.				
	q	1.2						
³⁷ Rb ₄₈ ⁸⁵	μ	1.3486	I	H. E. Walchli et al., Phys. Rev. <u>85</u> , 922 (1952).				
	Δν(Rb ⁸⁷)/Δν(Rb ⁸⁵) = 2.251413 ± 0.000005		M	S. A. Ochs, P. Kusch, Phys. Rev. <u>85</u> , 145 (1952).				

$^{42}\text{Mo}_{51}^{83}$	$(0.24e^-)\gamma(\theta)$ $\gamma\gamma(\theta)$	$b = +0.33$ $b = +0.20$	D. T. Stevenson, M. Deutsch, <u>Phys. Rev.</u> 83 , 1202(1951).	$^{47}\text{Ag}_{58}^{105}$	$\gamma's$ γ_1 0.0625 K/L > 5 γ_2 0.280 K/L = 8 γ_3 0.343 K/L = 5.8 γ_4 0.440 K/L = 7 Weak: 0.154, 0.181, 0.391 $\gamma_1\gamma_2, \gamma\gamma$	sl;ce ⁻	R. W. Hayward, <u>Phys. Rev.</u> 85 , 760A(1952); priv. comm. Rh($\alpha, 2n$); Pd(d).
$^{42}\text{Mo}_{54}^{86}$	$\sigma_a(\text{th } n)$ 1.2	osc	H. Pomerance, priv. comm. (1952).	$^{47}\text{Ag}_{59}^{106}$	$\gamma's$ 0.220 0.717 0.409 0.815 0.511 1.04 K/L = 8 1.235 0.620 1.55	sl,ce ⁻	R. W. Hayward, <u>Phys. Rev.</u> 85 , 760A(1952); priv. comm. Rh(α, n); Pd(d).
$^{42}\text{Mo}_{55}^{87}$	$\sigma_a(\text{th } n)$ 2.1	osc	H. Pomerance, priv. comm. (1952).	$^{47}\text{Ag}_{61}^{108}$	β^- 1.49 β^-/K ~2 γ ~1* 0.19 ~1* 0.42 ~4* 0.61 $\gamma\gamma$, no $\beta\gamma$ Pd K X-rays	scin	M. Goodrich, E. C. Campbell, <u>Phys. Rev.</u> 85 , 742A(1952); priv. comm. *Relative intensities.
$^{42}\text{Mo}_{56}^{88}$	$\sigma_a(\text{th } n)$ 0.38	osc	H. Pomerance, priv. comm. (1952).	$^{47}\text{Ag}_{63}^{110}$	γ (0.656) K/L = 14 270 ^d γ 1.00* 0.652 1.03* 0.886 0.26* 1.388 0.22* 1.484 *Relative intensities	sl;ce ⁻ s;Cpt	W. C. Kelly, <u>Phys. Rev.</u> 85 , 101(1952). B. S. Dzhelepov et al., <u>Doklady Akad. Nauk, S.S.S.R.</u> 77 , 597(1951); <u>Guide to Russ. Sci. Lit.</u> 4 , 369(1951).
$^{42}\text{Mo}_{58}^{100}$	$\sigma_a(\text{th } n)$ 0.5	osc	H. Pomerance, priv. comm. (1952).	$^{47}\text{Ag}_{68}^{115}$	τ 21 ^m P { (90.8%) 2.3 ^d Cd (9.2%) 43 ^d Cd		A. C. Wahl, and N. A. Bonner, <u>Phys. Rev.</u> 85 , 570(1952).
	$\sigma(\text{th } n, \gamma) 14.6^m\text{Mo}$ 0.23		V. Hummel, ANL-4659 (June 1951).	$^{48}\text{Cd}_{61}^{109}$	γ 0.087 (39 ^s Ag) $\alpha_K \sim 6$ K/L = 0.75	sl;ce ⁻	O. Huber et al., <u>Helv. Phys. Acta</u> 25 , 3 (1952). Ag(p,n).
$^{43}\text{Tc}_{51}^{84}$	51.5 ^m activity now assigned to Tc ⁸⁶ , q.v.		H. A. Medicus, H. T. Easterday, <u>Phys. Rev.</u> 85 , 735A(1952).	$^{48}\text{Cd}_{67}^{115}$	β^- 1.5 P (<0.02%) 4.5 ^h In	a	A. C. Wahl, N. A. Bonner, <u>Phys. Rev.</u> 85 , 570(1952).
$^{43}\text{Tc}_{53}^{86}$	τ_1 51.5 ^m Formerly assigned to Tc ⁸⁴		H. A. Medicus, H. T. Easterday, <u>Phys. Rev.</u> 85 , 735A(1952). Mo ⁸⁶ (4-Mev p,n).	$^{48}\text{Cd}_{67}^{115}$	τ 2.21 \pm 0.04 ^d β_1 15% 0.5 β_2 85% 1.1 γ ~0.55 $\beta_1\gamma$	a	A. C. Wahl, N. A. Bonner, <u>Phys. Rev.</u> 85 , 570(1952). Cd(n, γ); Cd(γ ,n); and fission.
	$\Gamma(0.8 \text{ level}) \leq 0.02 \text{ ev}$ $\tau(0.8 \text{ level}) \geq 0.5 \times 10^{-13}\text{s}$	scin	F. R. Metzger, <u>Phys. Rev.</u> 83 , 842(1951).	$^{49}\text{In}_{62}^{111}$	γ E γ 0.173 0.104 6.6 0.247 0.054 5.3		O. Huber et al., <u>Helv. Phys. Acta</u> 25 , 3 (1952). Cd(p,n).
$^{43}\text{Tc}_{56}^{88}$	μ + 5.6586	I	H. Walchli et al., <u>Phys. Rev.</u> 85 , 479(1952).	$^{49}\text{In}_{66}^{114}$	γ 0.192 K/L = 0.96	sl;ce ⁻	O. Huber et al., <u>Helv. Phys. Acta</u> 25 , 3 (1952). Cd(p,n).
	5.9 ^h	τ dependent on chemical state	K. T. Bainbridge et al., <u>Phys. Rev.</u> 84 , 1260(1951).	$^{50}\text{Sn}_{74}^{124}$	γ (0.192) K/L = 1.30 $\tau_{\beta\beta}$ > 1.7 \times 10 ¹⁷ y	sl;ce ⁻	W. C. Kelly, <u>Phys. Rev.</u> 85 , 101(1952). M. I. Kalkstein, W. F. Libby, <u>Phys. Rev.</u> 85 , 368(1952).
$^{46}\text{Rh}_{58}^{103}$	I $\frac{1}{2}$ μ ~ - 0.1	S	H. Kuhn, G. K. Woodgate, <u>Proc. Phys. Soc. (London)</u> A64 , 1090(1951).	$^{51}\text{Sb}_{69}^{120}$	6.0 ^d Sb ¹²⁰ assignment questioned		L. Katz, A. G. W. Cameron, <u>Can J. Phys.</u> 29 , 518(1951).
$^{46}\text{Rh}_{61}^{106}$	β^- 3% 2.0 12% 2.44 11% 3.1 68% 3.53 γ 1* 0.513 $\alpha_K = 3.5 \times 10^{-3}$, K/L = 8 0.53* 0.624 $\alpha_K = 2.1 \times 10^{-3}$ 0.03* 0.87 0.08* 1.045 0.025* 1.55 0.01** 2.41**	sl	D. E. Alburger, <u>Phys. Rev.</u> 85 , 734A(1952). *Relative intensities from pe ⁻ . **Priv. comm.				
$^{46}\text{Pd}_{62}^{108}$	$\tau_{\beta\beta}$ > 1.1 \times 10 ¹⁸ y	cc	R. G. Winter, <u>Phys. Rev.</u> 85 , 687(1952).				
$^{46}\text{Pd}_{64}^{110}$	$\tau_{\beta\beta}$ > 6 \times 10 ¹⁷ y	cc	R. G. Winter, <u>Phys. Rev.</u> 85 , 687(1952).				
Ag	$\sigma_s(\text{th } n)$ 5.72		C. T. Hibdon, ANL-4602 (Mar. 1951).				

$^{122}_{51}\text{Sb}$ 2.8^d	γ	0.58	a	L. Katz, A. G. W. Cameron, Can. J. Phys. 29, 518(1951).	$^{136}_{56}\text{Ba}$	$\sigma_a(\text{th n})$	0.4	osc	H. Pomerance, priv. comm. (1952).
Te	Isotope shift Increase at $\text{Te}^{128} - \text{Te}^{124}$		S	J. S. Ross, K. Murakawa, Phys. Rev. 85, 559(1952).	$^{137}_{56}\text{Ba}$ 2.60^m	γ	(0.662) K/L = 4.57	sl;ce $^-$	W. C. Kelly, Phys. Rev. 85, 101(1952).
$^{120}_{52}\text{Te}$	$\sigma_a(\text{th n})$	68	osc	H. Pomerance, T. Arnette, ORNL-940 (1950); priv. comm. (1952).	$^{138}_{56}\text{Ba}$	$\sigma_a(\text{th n})$	4.9	osc	H. Pomerance, priv. comm. (1952).
$^{122}_{52}\text{Te}$ $^{122}_{70}$	$\sigma_a(\text{th n})$	2.7	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).	$^{140}_{57}\text{La}$ $^{140}_{83}$	β^-	~ 2.3	scin	R. C. Bannerman et al., Phil. Mag. 42, 1097(1951). *% of γ 's.
$^{123}_{52}\text{Te}$ 90^d	$\gamma\gamma$ delay $< 10^{-9}$ s			F. K. McGowan, Phys. Rev. 85, 142 (1952).		γ_1	$< 1\%$ 0.093	scin	
$^{123}_{52}\text{Te}$ $^{123}_{71}$	$\sigma_a(\text{th n})$	390	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).		γ_2	3% 0.335		
$^{124}_{52}\text{Te}$ $^{124}_{72}$	$\sigma_a(\text{th n})$	6.5	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).	$^{138}_{58}\text{Ce}$ $^{138}_{80}$	$\sigma_a(\text{th n})$	25	osc	H. Pomerance, priv. comm. (1952).
$^{125}_{52}\text{Te}$ 58^d	γ	0.110 $\alpha_K = 160$ (0.035) $\alpha_K = 11.4$ K/L = 7.1, L/M = 5.3 sl, scin, pc	M1	J. C. Bowe, P. Axel, Phys. Rev. 85, 858(1952); 85, 734A(1952).	$^{138}_{58}\text{Ce}$ $^{138}_{80}$	$\sigma_a(\text{th n})$	8.7	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).
	$\gamma\gamma$ delay $< 2 \times 10^{-9}$ s			F. K. McGowan, Phys. Rev. 85, 142 (1952).	$^{140}_{58}\text{Ce}$ $^{140}_{82}$	$\sigma_a(\text{th n})$	0.63	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).
$^{125}_{52}\text{Te}$ stable	μ	-0.7 $\mu(\text{Te}^{125})/\mu(\text{Te}^{123}) = 1.186$	S	J. S. Ross, K. Murakawa, Phys. Rev. 85, 559(1952).	$^{142}_{58}\text{Ce}$ $^{142}_{84}$	$\sigma_a(\text{th n})$	1.76	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).
$^{125}_{52}\text{Te}$ $^{125}_{73}$	$\sigma_a(\text{th n})$	1.5	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).	$^{144}_{58}\text{Ce}$ $^{144}_{86}$	β^-	97% 0.307 3% 0.446	s	L. S. Cheng et al., Phys. Rev. 85, 487(1952). Fission; chem.
$^{126}_{52}\text{Te}$ $^{126}_{74}$	$\sigma_a(\text{th n})$	0.77	osc	H. Pomerance, T. Arnette, ORNL-940 (1950); priv. comm. (1952).		γ	0.0547 0.0794 K/L = 6.3 0.134 K/L = 8.3 0.231 K/L = 1.7		
$^{128}_{52}\text{Te}$ $^{128}_{76}$	$\sigma_a(\text{th n})$	0.3	osc	H. Pomerance, T. Arnette, ORNL-940 (1950); priv. comm. (1952).	$^{140}_{59}\text{Pr}$ $^{140}_{81}$	γ	(0.132) K/L = 5.3	sl;ce $^-$	W. C. Kelley, Phys. Rev. 85, 101(1952);
$^{130}_{52}\text{Te}$ $^{130}_{78}$	$\sigma_a(\text{th n})$	0.5	osc	H. Pomerance, T. Arnette, ORNL-940 (1950).		β^+	2.23	$s\pi\sqrt{2}$	C. I. Browne et al., Phys. Rev. 85, 146 (1952). Pr(19 Mev d)Nd 140 \rightarrow Pr 140 ; ion chem.
$^{131}_{53}\text{I}$ $^{131}_{78}$	β^-	1* 0.246 2* 0.328 0.638 0.720	a $\beta\gamma$	P. E. Cavanagh, Phil. Mag. 43, 221 (1952). *Relative intensities.	$^{144}_{59}\text{Pr}$ $^{144}_{85}$	β^-	3% 0.605 12% 1.30 85% 3.00	s	L. S. Cheng et al., Phys. Rev. 85, 487(1952).
	γ	(0.080 γ)(0.284 γ)(θ) constant	scin	D. Schiff, Phys. Rev. 85, 727A (1952).		β^-	2.97	$s\pi$	F. T. Porter, C. S. Cook, Phys. Rev. 85, 733A(1952).
$^{134}_{56}\text{Ba}$ $^{134}_{78}$	$\sigma_a(\text{th n})$	2	osc	H. Pomerance, priv. comm. (1952).	Nd		< 0.02 α 's/sec(gm of Nd) < 0.003 β 's/sec(gm of Nd)		G. I. Mulholland, T. P. Kohman, Phys. Rev. 85, 144(1952).
$^{135}_{56}\text{Ba}$ $^{135}_{79}$	$\sigma_a(\text{th n})$	5.6	osc	H. Pomerance, priv. comm. (1952).	$^{140}_{60}\text{Nd}$ $^{140}_{80}$	$E_{\text{dis}} \sim 0.1$, K capt/L capt = 2.8 from K x-ray intensities in Nd $^{140} \rightarrow$ Pr $^{140} \rightarrow$ Ce 140			C. I. Browne et al., Phys. Rev. 85, 146 (1952). Pr(19 Mev d); ion chem.
					$^{147}_{60}\text{Nd}$ $^{147}_{87}$	γ	0.0918 K/L $_1$ = 6.4	$s\pi$	J. W. Mihelich, E. L. Church, Phys. Rev. 85, 690(1952).

$^{150}_{90}\text{Nd}$	T_{β}	$>2 \times 10^{15}\text{y}$		G. I. Mulholland, T. P. Kohman, <u>Phys. Rev.</u> 85 , 144(1952).	Er	Isotope shifts (170-168): (168-166): (166-164) = 1:0.9:0.9	S	K. Murakawa, S. Suwa, <u>Phys. Rev.</u> 85 , 683(1952).
$^{148}_{87}\text{Pm}$	T_{β}	48 ^d		J. K. Long, M. L. Pool, <u>Phys. Rev.</u> 85 , 137(1952).	$^{171}_{103}\text{Er}$	γ 0.1128 K/L ~ 10 0.1179 ~ 0.5 0.1255 ~ 2 0.1764 0.2946 ~ 10 0.3075 ~ 10 0.4197	$s\pi$; ce^{-}	H. B. Keller, J. M. Cork, <u>Phys. Rev.</u> 84 , 1079(1951).
$^{150}_{89}\text{Pm}$	τ	2.7 ^h		J. K. Long, M. L. Pool, <u>Phys. Rev.</u> 85 , 137(1952).	$^{170}_{101}\text{Tm}$	β_1 0.876 β_2 0.970 β_1 F-K plot linear	sl ; $\beta\gamma$ sl	R. Richmond, H. Rose, <u>Phil. Mag.</u> 43 , 367(1952).
$^{152}_{89}\text{Eu}$ 9.2 ^h	γ	0.1219 K/L ~ 4 0.3441 K/L ~ 10 (Gd)	$s\pi$; ce^{-} (Sm)	H. B. Keller, J. M. Cork, <u>Phys. Rev.</u> 84 , 1079(1951).	γ	0.0848 K: $L_I: L_{II}: L_{III} =$ 0.29:0.1:0.83:1	$s\pi$	J. W. Mihelich, E. L. Church, <u>Phys. Rev.</u> 85 , 690(1952).
5.3 ^y	New assignment of γ 's				γ	0.085 $\alpha_K = 1.5$	$scin$ E2	F. K. McGowan, <u>Phys. Rev.</u> 85 , 151(1952).
$^{154}_{91}\text{Eu}$ 5.4 ^y	New assignment of γ 's			H. B. Keller, J. M. Cork, <u>Phys. Rev.</u> 84 , 1079(1951).	$^{176}_{106}\text{Lu}$ 3.75 ^h	β^{-} 1.1 1.2 γ 0.089 $\alpha = \text{large}$ K/L ~ 0.1	$scin$ E2	G. Scharff-Goldhaber et al., <u>Phys. Rev.</u> 85 , 734A(1952).
$^{150}_{86}\text{Gd}$	τ	long		S. G. Thompson et al., <u>Phys. Rev.</u> 85 , 758A(1952).	No γ with $0.6 < E_{\gamma} < 1$ (1.1 β)(0.089 γ) delay $< 1^{\mu s}$			
$^{159}_{86}\text{Gd}$	α	2.7		F. D. S. Butement, <u>Proc. Phys. Soc. (London)</u> A64 , 395(1951).	γ	0.0889 K: $L_{II}: L_{III} =$ 0.24:0.71:1	$s\pi$	J. W. Mihelich, E. L. Church, <u>Phys. Rev.</u> 85 , 690(1952).
$^{160}_{95}\text{Tb}$	γ	0.085 $\alpha_K = 1.6$	$scin$ E2	F. K. McGowan, <u>Phys. Rev.</u> 85 , 151(1952).	$^{177}_{106}\text{Lu}$	γ 0.112 $\alpha_K = 0.81$ $\tau < 5 \times 10^{-10}s$ 0.206 $\alpha_K = 0.04$ 4.5% 0.318 $\gamma\gamma(\theta)$ $b = -0.213$	$scin$ E2 E1	F. K. McGowan et al., <u>Phys. Rev.</u> 85 , 152(1952).
	$(\sim 0.9\beta)(0.085\gamma)$ delay $1.8 \times 10^{-9}s$			F. K. McGowan, <u>Phys. Rev.</u> 85 , 142(1952).	Hf	Relative abundances* 170, 171 $< 0.004\%$ 172, 173 $< 0.005\%$ 175 $< 0.006\%$		H. E. Duckworth et al., <u>Phys. Rev.</u> 85 , 929(1952). *Assuming $Hf^{174} = 0.18\%$.
Dy	$7^m\alpha$ activity formerly assigned to Tb or Gd now assigned to Dy. $E_{\alpha} = 4.2$.			S. G. Thompson et al., <u>Phys. Rev.</u> 85 , 758A(1952).	$\sigma_1(10.0 \text{ ev})$	17.0		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).
$^{165}_{89}\text{Dy}$ 2.4 ^h	γ	0.0951 K: $L_I: L_{III} =$ 6.4:1.0: < 0.2	$s\pi$	J. W. Mihelich, E. L. Church, <u>Phys. Rev.</u> 85 , 690(1952).	(120 ev)	13.1		
	γ	0.095 $\alpha_K \leq 2.9$	$scin$	F. K. McGowan, <u>Phys. Rev.</u> 85 , 142(1952).	(345 + 2400 ev)	14.4		
	$\beta(0.095\gamma)$ delay $< 0.8 \times 10^{-9}s$			F. K. McGowan, <u>Phys. Rev.</u> 85 , 142(1952).	(2700 ev)	14.8		
$^{166}_{98}\text{Ho}$	τ	$> 30^y$		F. D. S. Butement, <u>Proc. Phys. Soc. (London)</u> A65 , 254(1952). Ho(n, γ); chem.	$^{183}_{110}\text{Ta}$	τ 4.83 ^d		F. D. S. Butement, <u>Proc. Phys. Soc. (London)</u> A64 , 395(1951). W(γ); chem.
	β_1 46%	0.18	$a\beta\gamma$					
	β_2 46%	0.28	$a\beta\gamma$					
	β_3 8%	1.1	a					
	γ_1	0.095	$scin$					
	γ_2	0.212						
	γ_3	0.280						
	γ_4	0.725						
	γ_5	0.830						
27.3 ^h	γ	0.081 $\alpha_K = 1.9$	$scin$ E2	F. K. McGowan, <u>Phys. Rev.</u> 85 , 151(1952).	W	$\sigma_1(2700 \text{ ev})$ 8.45 (3000 ev) 8.31		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).
	γ	0.0807 K: $L_I: L_{II}: L_{III} =$ 0.13: < 0.1 : < 0.72 :1	$s\pi$	J. W. Mihelich, E. L. Church, <u>Phys. Rev.</u> 85 , 690(1952).	$^{180}_{106}\text{W}$	$\sigma_a(\text{th n})$ 30	osc	H. Pomerance, <u>ORNL-1164</u> (1951); priv. comm. (1952).
					$^{182}_{108}\text{W}$	$\sigma_a(\text{th n})$ 19.2	osc	H. Pomerance, <u>ORNL-1164</u> (1951); priv. comm. (1952).
					$^{183}_{109}\text{W}$	$\sigma_a(\text{th n})$ 10.9	osc	H. Pomerance, <u>ORNL-1164</u> (1951); priv. comm. (1952).

⁷⁴ W ₁₁₀ ¹⁸⁴	σ_a (th n)	1.97	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).	Pb	σ_a (th n)	0.162	osc	D. J. Littler, E. E. Lockett, priv. comm. (1952).
⁷⁴ W ₁₁₂ ¹⁸⁶	σ_a (th n)	34.1	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).	⁸² Pb ₁₂₄ ²⁰⁶	σ_a (th n)	0.026	osc	D. J. Littler, E. E. Lockett, priv. comm. (1952).
⁷⁵ Re ₁₁₀ ¹⁸⁵	σ_a (th n)	100	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).	⁸² Pb ₁₂₅ ²⁰⁷	σ_a (th n)	0.69	osc	D. J. Littler, E. E. Lockett, priv. comm. (1952).
⁷⁵ Re ₁₁₂ ¹⁸⁷	σ_a (th n)	63	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).	⁸² Pt ₁₂₈ ²¹⁰	β^-	0.018	scin	R. C. Bannerman, S. C. Curran, <u>Phys. Rev.</u> 85 , 134(1952).
⁷⁷ Ir ₁₁₅ ¹⁹²	τ	74.37 ^d		J. Kastner, <u>Can. J. Phys.</u> 29 , 480(1951).		γ	0.0467 (0.0467 γ) β^-		
Pt	Relative abundances*			H. E. Duckworth et al., <u>Phys. Rev.</u> 85 , 929(1952). *Assuming Pt ¹⁹⁰ = 0.012%.		$\gamma\gamma$ for $E_\gamma = 16 - 30$ kev			
	188, 189	<0.002%				β^-	0.018	pc	G. M. Insch et al., <u>Phys. Rev.</u> 85 , 805 (1952).
	191	<0.004%				E_{dis}	0.065		
	193	<0.009%			⁸² Pb ₁₃₀ ²¹²	H ρ (F)	1388.5 \pm 0.3	sl	H. Craig, <u>Phys. Rev.</u> 85 , 688(1952).
	197	<0.010%				H ρ (I)	1753.9 \pm 0.4		
	199	<0.008%			⁸³ B ₁₂₀ ²⁰³	α	~ 4.85	pc	D. C. Dunlavey, G. T. Seaborg, <u>Phys. Rev.</u> 85 , 757A(1952).
Au	σ_s (th n)	7.56		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).		α/K	$\sim 10^{-7}$		Pb(60 Mev p); chem.
⁷⁹ Au ₁₁₈ ¹⁹⁷	μ	+0.136	S	F. G. Kelly, <u>Proc. Phys. Soc. (London)</u> A65 , 250(1952).	⁸³ B ₁₂₇ ²¹⁰	α	4.93		H. B. Levy, I. Perlman, <u>Phys. Rev.</u> 85 , 758A (1952).
⁷⁹ Au ₁₁₉ ¹⁹⁸	γ	0.411	sl;ce ⁻	O. Huber et al., <u>Helv. Phys. Acta</u> 25 , 3 (1952).					Bi(n, γ); ms.
		$\alpha_K = 2.75 \times 10^{-2}$			⁸³ B ₁₂₉ ²¹²	H ρ (A)	533.66 \pm 0.12	sl	H. Craig, <u>Phys. Rev.</u> 85 , 688(1952).
		K/L = 2.2			⁸⁴ Po ₁₂₆ ²¹⁰	$\alpha\gamma(\theta)$ indicates E2 γ		scin	S. DeBenedetti, G. H. Minton, <u>Phys. Rev.</u> 85 , 944(1952); 85 , 726A(1952).
	No ce ⁻ with E < 0.328			F. K. McGowan, <u>Phys. Rev.</u> 85 , 142(1952).		$\alpha\gamma$ delay < 10 ^{-8s}			
⁷⁹ Au ₁₂₁ ²⁰⁰	48 ^m produced by Hg(γ); chem			F. D. S. Butement, <u>Proc. Phys. Soc. (London)</u> A64 , 395 (1951).	⁸⁶ Ra ₁₄₀ ²²⁸	σ (th n, $\gamma\beta$) 66 ^m Ac ~ 36			F. Depocas, B. G. Harvey, <u>Phys. Rev.</u> 85 , 499(1952).
Hg	σ_s (thermal)	26.56		C. T. Hibdon, <u>ANL-4602</u> (Mar. 1951).	⁸⁸ Ra ₁₄₂ ²³⁰	τ	1 ^h		W. A. Jenkins, G. T. Seaborg, <u>Phys. Rev.</u> 85 , 758A(1952).
	σ_t (10.0 ev)	13.93				β^-	1.2	$s\pi$	Th(180 Mev d); chem.
	(19.5 ev)	13.3			⁸⁸ Ac ₁₃₉ ²²⁸	β^-	~ 1	$s\pi$	C. G. Campbell et al., <u>Phil. Mag.</u> 42 , 126(1952).
	(2700 ev)	10.4					1.6		
	(3000 ev)	10.7					1.8		
⁸⁰ Hg ₁₁₇ ¹⁹⁷	τ	66.4 ^h		J. M. Cork et al., <u>Phys. Rev.</u> 85 , 386 (1952). Hg(pile n).	⁸⁸ Ac ₁₄₀ ²²⁹	τ	66 \pm 5 ^m		F. Depocas, B. G. Harvey, <u>Phys. Rev.</u> 85 , 499 (1952).
⁶⁵ h	γ	0.0776	$s\pi$;ce ⁻						Ra ²²⁸ (n, $\gamma\beta$); chem.
		0.1914	(Au)						
		K/L ~ 9							
25 ^h	γ	0.1343	$s\pi$;ce ⁻	J. M. Cork et al., <u>Phys. Rev.</u> 85 , 386 (1952). Hg(pile n).					
		K/L < 0.1	(Hg)						
		0.1654							
		K/L ~ 0.25	(Hg)						
⁸⁰ Hg ₁₂₃ ²⁰³	τ	47.9 ^d		J. M. Cork et al., <u>Phys. Rev.</u> 85 , 386 (1952). Hg(pile n).					
	γ	0.2795	$s\pi$;ce						
		K/L ~ 10							
	β (0.28 γ) delay < 0.4 $\times 10^{-9s}$			F. K. McGowan, <u>Phys. Rev.</u> 85 , 142(1952).					
⁸¹ Tl ₁₂₂ ²⁰³	σ_a (th n)	11.0	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).		τ	67 ^m		W. A. Jenkins, G. T. Seaborg, <u>Phys. Rev.</u> 85 , 758A (1952).
⁸¹ Tl ₁₂₄ ²⁰⁵	σ_a (th n)	0.77	osc	H. Pomerance, ORNL-1164(1951); priv. comm. (1952).					Ra ²²⁶ (α ,p).

$^{89}\text{Ac}_{141}^{230}$	τ β^-	$<1^m$ 2.2	$s\pi$	W. A. Jenkins, G. T. Seaborg, <u>Phys. Rev.</u> 85 , 758A (1952). d Ra 230 .	$\text{N}^{14}(n,\alpha)\text{B}^{11}$	-0.24	W. Bollmann, W. Zündt, <u>Helv. Phys. Acta</u> 24 , 517(1951).
$^{92}\text{U}_{142}^{234}$	γ	$\geq 35\%$ 0.055	ppl	J. Teillac, <u>Compt. rend.</u> 230 , 1056 (1950).	$\text{C}^{12}(\gamma,n)\text{C}^{11}$	-18.7	L. Katz, A. G. W. Cameron, <u>Can. J. Phys.</u> 29 , 518(1951) and L. Katz et al., <u>Can. J. Research</u> 28A , 113(1950).
$^{92}\text{U}_{146}^{238}$	γ	$\geq 24\%$ ~0.050	ppl	G. Albouy, J. Teillac, <u>Compt. rend.</u> 234 , 829(1952).	$\text{O}^{16}(\text{d},\alpha)\text{N}^{14}$ $\text{O}^{16}(\text{d},\text{p})\text{O}^{17}$ $\text{F}^{19}(\text{d},\alpha)\text{O}^{17}$	+ 3.09 \pm 0.02 + 1.93 \pm 0.01 + 10.04 \pm 0.02	H. B. Burrows et al., <u>Proc. Roy. Soc. (London)</u> 209A , 478(1951).
	γ	$\geq 23\%$ 0.048	ppl	B. Zajac, <u>Phil. Mag.</u> 42 , 264(1952).	$\text{O}^{16}(\text{d},\text{n})\text{F}^{17}$	-1.51	F. A. El-Bedewi et al., <u>Proc. Phys. Soc. (London)</u> A64 , 757 (1951).
	$\sigma(\text{th } n, f)$	$<5 \times 10^{-4}$		R. L. Macklin, J. H. Lykins, <u>J. Chem. Phys.</u> 19 , 844(1951).	$\text{F}^{19}(\text{d},\text{p})\text{F}^{20}$	+ 4.39 \pm	H. B. Burrows et al., <u>Phys. Rev.</u> 85 , 155(1951).
$^{92}\text{U}_{147}^{239}$	β^- γ 2.0 β and 0.9 γ not found	1.22 0.075	sl scin	J. R. Huizenga et al., <u>Phys. Rev.</u> 84 , 1264 (1951). U 238 (pile n); chem.	$\text{F}^{19}(\text{p},\text{n})\text{Ne}^{19}$ $\text{F}^{19}(\text{p},\text{n})\text{Ne}^{19}$	-4.040 \pm 0.004 -4.1	H. B. Willard et al., <u>Phys. Rev.</u> 85 , 849(1952). J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).
$^{93}\text{Np}_{142}^{235}$	τ K < 10% L > 90%	410 ^d	pc	R. A. James et al., <u>Phys. Rev.</u> 85 , 369 (1952). U 235 (20 Mev d, 2n).	$\text{Na}^{23}(\text{p},\alpha)\text{Ne}^{20}$ $\text{Ne}^{20}(\text{d},\text{p})\text{Ne}^{21}$ $\text{Ne}^{22}(\text{d},\text{p})\text{Ne}^{23}$ $\text{Mg}^{25}(\text{d},\alpha)\text{Na}^{23}$	+2.372 \pm 0.008 +4.529 \pm 0.007 +2.964 \pm 0.007 +7.019 \pm 0.013	D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142(1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
$^{93}\text{Np}_{146}^{239}$	No E_β	>0.72	sl	J. R. Huizenga et al., <u>Phys. Rev.</u> 84 , 1264 (1951).	$\text{Na}^{23}(\text{p},\text{n})\text{Mg}^{23}$	-4.97	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).
$^{95}\text{Am}_{146}^{241}$	τ	475 ^y		B. B. Cunningham, quoted by L. B. Asprey et al., <u>J. Am. Chem. Soc.</u> 73 , 5715(1951).	$\text{Al}^{27}(\text{p},\alpha)\text{Mg}^{24}$ $\text{Mg}^{24}(\text{d},\text{p})\text{Mg}^{25}$	+1.595 \pm 0.007 +5.097 \pm 0.007	D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142(1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
		470 ^y		B. G. Harvey, <u>Phys. Rev.</u> 85 , 482(1952).	$\text{Mg}^{24}(\text{d},\text{p})\text{Mg}^{25}$ $\text{Mg}^{25}(\text{d},\text{p})\text{Mg}^{26}$ $\text{Mg}^{25}(\text{d},\text{p})\text{Mg}^{26}$ $\text{Mg}^{26}(\text{d},\text{p})\text{Mg}^{27}$	+4.99 \pm 0.10 +8.86 \pm 0.10 +8.880 \pm 0.012 +4.207 \pm 0.006	J. Ambrosen, <u>Nature</u> 169 , 408(1952). D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142(1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
	$\sigma(\text{pile } n, \gamma)$	400 ^y Am 242 ~50		K. Street, Jr., et al., <u>Phys. Rev.</u> 85 , 135 (1952).	$\text{Mg}^{26}(\text{d},\text{p})\text{Mg}^{27}$	+4.16 \pm 0.10	J. Ambrosen, <u>Nature</u> 169 , 408(1952).
$^{95}\text{Am}_{147}^{242}$ ~16 ^h	$\sigma(\text{pile } n, f)$	~2000		K. Street, Jr., et al., <u>Phys. Rev.</u> 85 , 135 (1952).	$\text{Mg}^{24}(\text{p},\text{n})\text{Al}^{24}$	-14.8 \pm 0.3	A. C. Birge, <u>Phys. Rev.</u> 85 , 753A(1952).
~400 ^y	$\sigma(\text{pile } n, \gamma)$ Am 243 $\sigma(\text{pile } n, f)$	~2000 ~6000		K. Street, Jr., et al., <u>Phys. Rev.</u> 85 , 135 (1952).	$\text{Mg}^{25,26}(\text{p},\text{n})\text{Al}$	-5.1	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).
$^{95}\text{Am}_{148}^{243}$	$\sigma(\text{pile } n, f)$	<40		K. Street, Jr., et al., <u>Phys. Rev.</u> 85 , 135 (1952).	$\text{Si}^{29}(\text{d},\alpha)\text{Al}^{27}$	+5.994 \pm 0.011	D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142(1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
					$\text{Al}^{27}(\text{p},\text{n})\text{Si}^{27}$	-5.9	J. P. Blaser et al., <u>Helv. Phys. Acta</u> 24 , 465(1951).
Q's Between Ground States					$\text{P}^{31}(\text{p},\alpha)\text{Si}^{28}$ $\text{P}^{31}(\text{d},\alpha)\text{Si}^{29}$ $\text{Si}^{29}(\text{d},\text{p})\text{Si}^{30}$ $\text{Si}^{30}(\text{d},\text{p})\text{Si}^{31}$	+1.909 \pm 0.010 +8.158 \pm 0.011 +8.388 \pm 0.013 +4.364 \pm 0.007	D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142 (1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
D(γ ,n)H 1	-2.231 \pm 0.003	J. C. Noyes et al., <u>Phys. Rev.</u> 85 , 727A(1952).			$\text{Si}^{28}(\text{d},\text{n})\text{P}^{29}$ $\text{Si}^{29}(\text{d},\text{n})\text{P}^{30}$ $\text{Si}^{30}(\text{d},\text{n})\text{P}^{31}$	+0.29 \pm 0.04 +3.27 \pm 0.04 +4.92 \pm 0.04	C. E. Mandeville et al., <u>Phys. Rev.</u> 85 , 193(1952); 85 , 725A(1952).
H 2 (d,n)He 3	+3.24 \pm 0.04	H. Bichsel et al., <u>Helv. Phys. Acta</u> 25 , 119 (1952).			$\text{P}^{31}(\text{d},\text{p})\text{P}^{32}$	+5.704 \pm 0.008	D. M. Van Patter et al., <u>Phys. Rev.</u> 85 , 142(1952); <u>MIT Progress Report</u> , Nov. 1951, 44.
B 10 (n, α)Li 7	+2.78 \pm 0.02						
Li 8 (t,d)Li 7	+0.982 \pm 0.007	T. P. Pepper et al., <u>Phys. Rev.</u> 85 , 155(1952).					
Li 8 (t,p)Li 8	+0.784 \pm 0.015						
Be 9 (γ ,n)Be 8	-1.664 \pm 0.002	J. C. Noyes et al., <u>Phys. Rev.</u> 85 , 727A(1952).					

NUCLEAR SCIENCE ABSTRACTS

$P^{32}(d,n)S^{32}$	$+6.81 \pm 0.08$	F. A. El-Bedewi et al., <u>Nature</u> 169 , 235(1952).	$Ru^{101}(p,n)Rh^{101}$	-2.6	J. P. Blaser et al., <u>Helv.</u>
$Cl^{37}(p,n)A^{37}$	-1.598 ± 0.002	W. A. Schoenfeld et al., <u>Phys. Rev.</u> 85 , 873(1952).	$Te^{128}(p,n)I^{128}$	-3.2	<u>Phys. Acta</u> 24 , 441(1951).
$Cr^{53}(p,n)Mn^{53}$	-1.380 ± 0.008	J. A. Lovington et al., <u>Phys. Rev.</u> 85 , 585(1952).	$Te^{130}(p,n)I^{130}$	-3.3	
$Cr^{54}(p,n)Mn^{54}$	-2.163 ± 0.005		Packing Fraction Differences, Δf , in Units 10^{-4} amu.		
$Mn^{55}(p,n)Fe^{55}$	-1.01	P. H. Stelson, W. M. Preston, <u>Phys. Rev.</u> 83 , 469(1951).	Doublet	Δf	Reference
$Ni^{62}(p,n)Cu^{62}$	-4.6	J. P. Blaser et al., <u>Helv.</u>	$K^{39} - C_2HN$	-12.20 ± 0.02	A. Henglein, <u>Z. Naturforsch.</u>
$Ni^{64}(p,n)Cu^{64}$	-2.5	<u>Phys. Acta</u> 24 , 441(1951).	$K^{41} - C_2H_3N$	-15.88 ± 0.01	<u>6a</u> , 745(1951).
$Se^{76}(p,n)Br^{78}$	-4.4				
$Se^{80}(p,n)Br^{80}$	-2.6		Atom	Mass	Reference
$Sr^{87}(p,n)Y^{87}$	-2.5		Na^{23}	22.99665 ± 0.00008	A. Henglein, <u>Z. Naturforsch.</u>
$Y^{89}(p,n)Zr^{89}$	-3.5				<u>6a</u> , 745(1951).
$Zr^{92}(p,n)Nb^{92}$	-2.5		Pb^{208}	208.0416 ± 0.0015	Double doublet
$Zr^{96}(p,n)Nb^{96}$	-2.6				P. I. Richards et al., <u>Phys.</u>
$Nb^{93}(p,n)Mo^{93}$	-3.7		Bi^{209}	209.0466 ± 0.0015	<u>Rev.</u> 85 , 630(1952).
$Mo^{94}(p,n)Tc^{94}$	-5.0				Time of flight.
$Mo^{95}(p,n)Tc^{95}$	-3.6				
$Mo^{96}(p,n)Tc^{96}$	-3.8				
$Ru^{100}(p,n)Rh^{100}$	-4.1				

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